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LUMINARY Memo #185

To: Distribution
From: D. Densmore
Date: 17 December 1970
Subject: LUMINARY Revision 191

The following changes were implemented in Luminary Rev. 191: PCR 1088, PCR 336, PCR 1097.2, PCR 1100, PCR 1117.2, PCR 341, and corrections to the implementation of PCR 324, PCR 333, and ACB L-34.

- 1) PCR 1088 (Inhibit program change during critical 10.56 seconds after IMU zero).
 - a) R02BOTH was moved from bank 4 to bank 15 to make room for implementation of PCR 1088. The routine is 16 words long.
 - b) V37 coding was changed to lock out V37 during IMU zero so the DAP won't be left off. V37 checks bit 5 of IMODES33. If it is on, it branches to CANTROO (1520 alarm, RELDSP, and PINBRANCH). This bit is set for 10.56 seconds after a V40-requested IMU zero has taken place.
- 2) PCR 336 rev. 1 (Allow Extended Verbs during P20 maneuvers).
 - a) The V06N18 display was removed from R60, along with the mechanism in the Display Interface Routines for locking other things out so as to maintain the display. The flag bit which controlled the locking out of other displays was set in P20 before it calls R60 and used in R60 to make the V50N18 display a priority display and make it restartable. These functions are retained.
 - b) The Display Interface Routines refer to this flag bit in many places, and the usage is not by the bit name but is buried in masks. Rather than attempt the perilous task of finding and altering all these masks a new flag bit was assigned so that the other usage would not impact the DIR. DIR formerly used the bit to know to lock out other displays even though there was no priority display in

ENDIDLE. Now it will always be clear. PDSPFLAG was formerly flagword 4, bit 12, and is now flagword 5, bit 14.

- c) In order to make room in Bank 26 to implement the change in R60, the routine INTGRCAL was moved from bank 26 into bank 25.

INTGRCAL is a 7-word interpretive routine.

3) PCR 1097.2 (Provide V30, V31 operator error lockout).

- a) N26 erasables, N26/PRI (1) and N26/2CAD (2), were made unshared instead of using DSPTEMs. This means that these erasables can be loaded at any time and the information left in there while other programs are being run.
- b) N26/PRI was put in the noun tables for N26.
- c) Pinball was changed to use the new N26 erasables instead of DSPTEM1 and to check for R1 of N26 = 0 (operator error - lock out V30 or V31).
- d) Routine TSTLTS2 (5 words, called via WAITLIST) was moved from Bank 41 to Bank 40 to make room for the new Pinball Game coding.

4) PCR 1100 (Delete setting of NODOFLAG in R47).

The coding in R47 was changed not to set NODOFLAG. In the case of a restart R47 is not restarted and NODOFLAG could have been left on. This would have prevented any V37 request except for P00 from being acted upon without intervening selection of P00, V96, or reselection of V47.

5) PCR 1117.2 (Prevent POODOOs caused by extended verbs).

- a) On a POODOO, EXTVBACT is tested with a CCS and if it is positive a TCF Whimper is made to turn it into a functional BAILOUT (the POODOO alarm code is retained). If it comes back again it must have been from the mission program, since extended verbs aren't restartable. This time, however, EXTVBACT will be zero and a real POODOO will be performed.
- b) Routine ALMCYCLE (7 words) was moved from FF2 into FF3 to make room for the test for extended verb active in POODOO.

6) PCR 341 (Landing radar reasonability test).

The landing radar reasonability test could have locked out valid altitude updating especially if the lunar terrain model was inhibited (V68) during the approach phase. This was corrected by increasing the slope used in the reasonability test to 0.25 from 0.125. 0.25 is sufficient to prevent updates that could cause guidance interface problems. This slope was effectively changed by changing the scaling of DELTAH in the reasonability test calculation in TERSKIP.

7) PCR 324 (PGNCS-AGS rendezvous radar data transfer).

R22LEM42 was changed to call 2SECDELY to ensure adequate time for AGSCODE word to be recognized on the downlist as being in the set configuration when the NOUPDATE flag is set and when UPDATE flag is not set.

8) PCR 333 (Change ROD recognition).

A keypunch error (MARK for MASK) was corrected.

9) ACB L-34 (Erasable cleanup).

Unused tags for system test erasables were deleted from the erasable assignments log section.

GSOP impact:

The following items should be examined for impact on the various GSOP sections:

section 2 items 1, 2, 4, 7.

section 3 item 1.

section 4 items 1, 2, 3, 5, 7.

section 5 items 6, 7.